Resource Efficiency Management - An Innovative Energy Management Support Tool

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Overview

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- REM Approach
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- Client Testimonials

Resource Efficiency Management

"***Resource Efficiency Management*** *is a systematic, holistic approach to managing energy, water, environmental and financial resources, eliminating or minimizing waste and emissions to the environment, on a sustainable and cost-effective basis."*

REM Background

- Energy Market Issues - Uncertainty, Reliability, and Security
- Compliance with Federal Laws and Regulations
  - Energy Policy Act
  - EOs on “Greening” the Government
- Resources, Dollars, and Capabilities Are Limited
  - Shrinking Budgets
  - Change Over in Personnel
  - Reduced Staffing (MEO/Privatization)
  - More Responsibility with Fewer Resources
  - Do More with Less

REM – An Innovative Solution

- Onsite Expert Energy Management Consulting Services
- Holistic Energy Management Approach
- Focused on Behavior Characteristics and No/Low Cost Solutions (people) as well as efficiency enhancements (technology)
- Self-Funding

Tetra Tech REM Approach

- Place someone in the field with a knowledge of the customer
- Place someone in the field with applicable technical knowledge
- Provide the REM with a set of tools to work with, for example a list of possible projects
- Support the REM with a network of other REMs and technical experts, Teamwork

Tt REM Approach, Teamwork

- Partner with the Customer understand mission requirements
- Work with facilities personnel to develop strategies and projects
- Use working knowledge of the Customer to maximize results
- Share lessons learned and actively transfer technology across REM programs

Integrated REM Programs

- MCB Camp Pendleton
- MCAS Camp Pendleton
- MCRD San Diego
- MCB Hawaii
- PACAF
- Misawa AB
- USPS
- NBSD
- NBPL
- NAF El Centro
- NWS Seal Beach
- NAS Fallon
- NBC
- PWC San Diego
- NOAA

REM Services

Services

- Conduct training
- Identify & develop projects
- Steer ESPC & UESC surveys & designs
- Execute projects
- Obtain grants & incentives
- Perform measurement & verification services
- Review & analyze data
- Conduct energy surveys & walkthroughs
- Provide technical expertise

Tangible Benefits

- Dollar $ savings
- Consumption (kwh) reductions
- Demand (kw) reductions
- Energy management services
- Avoided project & survey costs
  - Catch bad projects
  - Catch bad scope
  - Ensure proper sizing
  - Catch excessive prices
- Prepare directives, reports & presentations
- Grants, incentives and other funding

NRSW REM Program

- 9 REMs Supporting 11 Installations
- Professional Energy Management Services
- Project Development & Execution
  - Critical to Execution of $60M in Projects
  - UESC, ESPC & Other
- Energy Awareness & Training
- Data Analysis & Reporting
- Energy Resource Accounting
- Design Review, LEED Support
- Grants & Incentives

REM Major Initiatives

- 750 KW Photovoltaic System
- Base-wide CFL Retrofit
- HID Lighting Retrofit
- Compressed Air System Upgrades
- Demand Response Program
- Building Energy Monitor Training
- Building Tuning Program

Example Project

750 kW Photovoltaic system, Naval Base Coronado: REMs were key to conceiving and managing the installation of one of the largest PV system in the Federal government – Dedicated 11/8/02.

Example Project

***Compressor retrofits**: REM compressor projects*

Offer substantial kw, kwh and co

with

Paybacks from 6 months to 2 ye

The compressor retrofit at NAS North Island will save about 3,750,000 kwh per year

Example Project

T5 replacements of HIDs, with zone controls:

Replacement of HIDs by T5s, with zone controls,

Improves quality of light, reduces kw and kwh, gives

operators control of their lights, and offers fast

Paybacks with low risk.

Note difference in light and color in T5 demonstration at Bldg 472, NADEP North Island

NRSW REM Program Results

- Navy Region Southwest
  - Energy Savings: $37.8M
  - Energy Projects: $19.8M
  - Grants: $10.8M
  - Benefit-Cost Ratio 10:1
  - Awards:
    - 2 Secretary of the Navy Awards
    - 6 Federal Energy and Water Management Award
    - 1 Presidential Award
    - All Bases Rated at Least Blue

Marine Corps REM Program

- 4 REMs Supporting 4 Installations
- Professional Energy Management Services
- Project Development & Execution
  - Critical to the Development, Review, and Execution of $17M in Projects
  - UESC, ESPC & Other Projects
  - 5 ECIP Project Submittals and Awards
- Energy Awareness & Training
- Data Analysis & Reporting
- Grants & Incentives

Marine Corps REM Initiatives

- PV Street Lights – Largest Individual Application in DOD
- Bi-Level Parking Lot Lighting
- Front-loading Washing Machines
- Outside Lighting Retrofit
- Air Conditioning and EMS Upgrades
- Base-wide CFL Retrofit
- Energy Training
- Metering Upgrade Program

Example Project

Proper sizing of replacement equipment: *REMs ensure replacement equipment is properly sized for known requirements i.e., avoid the "1-for- trap"; this often help the economics of the project*

These two 313 kva Motor generator sets are being replaced by two 175 kva units

Example Project

***Bi-level parking lot lights**: REMs showed practicality of exterior lights that go to half power when not needed.*

Parking lot lights At Lot 9, NAVBASE San Diego are dim 90 – 95% of the time

Client Service -- Summary

- United States Marine Corps
  - Energy Savings: $15M
  - Energy Projects: $10M
  - Grants: $432K
  - Benefit-Cost Ratio 10:1
  - Awards:
    - 3 FEMP Energy and Water Award
    - 2003 EPA Energy Efficiency Award

Client Testimonial

"In my opinion, the Regional money spent on the REM program has been some of the best money ever spent by the Navy! … The program has paid for itself many times over, and with the quality people we have as REMs I'm sure will continue to do so for a long time to come!" – John Thomas, Utilities Director, PWC San Diego, 2001